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The Oral Cancer Teaching Program in Dental Schools

By Raymond F. Kaiser, M.D.*

It is generally acknowledged today that close cooperation and mutual consultation among physicians, surgeons, radiologists, and pathologists is necessary for the discovery, diagnosis, and management of every cancer case if the patient is to receive the maximum opportunity for cure. In the discovery and management of cancer of the mouth, the dentist joins this group as an indispensable partner.

The most effective way to discover cancer in an early stage is through careful periodic examinations. Because the dental profession through its public education program has been successful in motivating people to visit their dentists regularly, the dentist has an unequalled opportunity for periodic inspection of the oral cavity among his patients under the most desirable conditions. Therefore, the dentist occupies a unique position in regard to the early diagnosis of intra-oral cancer. If properly informed and trained, the dentist is in a position to find many early cases of cancer. In fact, he is able to assume an important role in case finding and preventive medicine. It is an enviable role in that he is able to mention a suspicious lesion without disturbing his patient emotionally, while at the same time, his position professionally carries authority to induce the patient to take his advice.

Another advantage possessed by a member of the dental profession is the opportunity to follow up the patient whom he has advised to seek further medical examination. This he can do by scheduling a dental appointment subsequent to the date the patient was referred for medical attention. When the dentist knows that his patient is disregarding his advice, he may find it desirable to perform a biopsy. In such a situation the dentist should be prepared to take a specimen for biopsy to send to a qualified pathologist.

Of import is the fact that the dentist himself has a significant role to play in actual cancer cases. Experience has shown that an appreciably large number of patients with intra-oral cancer, particularly

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cancer of the gingivae, consulted their dentist prior to seeking advice from their physician, thereby providing the dentist with the initial opportunity to detect and observe early cancer. Participation by the dentist is often rather extensive. Often he can contribute immeasurably to the welfare of the cancer patient through dental care before and after cancer therapy.

Finally, in no other type of cancer is prevention as possible as it is for cancers of the oral cavity. As James Ewing has stated: "The responsibility for detecting and preventing intra-oral cancer falls chiefly on the dental profession." The dentist can aid materially in the prevention of mouth cancer by searching for and correcting oral conditions, such as chronic chemical or mechanical irritations which may contribute to the causation of cancer.

Recognizing this situation and appreciating the extensive role the dental profession can play in the control of mouth cancer, the National Cancer Institute directed its attention toward enlisting the participation of the dental profession in cancer control. In 1947, at a joint meeting of the Institute and the Council on Dental Education of the American Dental Association, it was agreed that the dental profession in general would be aided if a program were initiated to integrate instruction on oral cancer, particularly early diagnosis. It was also agreed that the profession should be oriented to the specific dental aspects of the cancer problem.

It was upon these recommendations that the National Cancer Institute, with the approval of the National Advisory Cancer Council, undertook a program of grants-in-aid to dental schools for the improvement of cancer teaching. For this purpose approved dental schools were eligible to receive up to $5,000 annually. The Council specifically requested the schools to review their present teaching methods and recommended that, if an integrated course in cancer was not already given, the schools consider a program of instruction in which material in the basic sciences relative to cancer would be correlated with clinical instruction in cancer. The Council also recommended that the schools give attention to stimulating cancer research since research improves teaching and stimulates student interest.

One of the most encouraging developments in cancer education has been the growing interest and activity of the dental schools in this program. At present 38 of the 42 dental schools are participating.

In initiating the program, the National Cancer Institute recognized the fact that the most effective methods of improving cancer instruction would differ from school to school, and decided that each school should endeavor to develop the type of program which best met its particular circumstances. Assurance of continuity of funds and maximum flexibility in their use was given by the National Cancer Institute.

This degree of freedom and the lack of precedents resulted initially in some confusion in the organization of teaching programs. Arising out of this situation was the development of various kinds of programs in the schools of dentistry. In each school a member of the faculty was designated to serve as a cancer coordinator. At present, there are nine general pathologists, eight oral pathologists, seven oral surgeons, six teachers of dental medicine, two dental school deans, two clinical pathologists, two oral histologists, one oral diagnostician, and one radiologist serving as cancer coordinators. In 21 schools the coordinator has the benefit of the advice and assistance of a special cancer teaching committee, appointed during the initial period of the grants program. The committee members are representatives of the several teaching disciplines.

The schools show many similarities in their programs to improve dental education in cancer. The grant program has made it possible for all participating dental schools to strengthen their visual education materials: 38 schools have undertaken the collection of a library of color photographs and lantern slide preparations of cancer lesions; 27 schools have been able to acquire photomicrographs; 28 schools have begun the compilation of a series of histopathologic slides concerned with oral cancer and have purchased additional equipment for their pathology laboratories, such as microscopes and scopicons.

In a number of schools, teaching aids and materials of other types have been added. These consist of specimen displays in 14 schools; exhibits, in 4; moulages, in 3; and models, in 3. Purchase of these materials is indicative of the paucity of this type of teaching materials in the schools and reflects a trend to improve oral cancer teaching materials.

That the schools' interest in oral cancer teaching has increased is shown by the fact that the equivalent of 47 full-time instructors have been added to the staffs of the Nation's dental schools under this program. While serving as instructors, 8 persons are being supported in their training for graduate degrees in fields related to oral oncology.

Since effective teaching in oral cancer, as in any type of cancer instruction, is directly related to the quality of clinical material available for presentation, 28 schools have supplemented their clinical teaching by arranging for their dental students to participate in tumor clinic activities. In 28 schools, demonstration clinics have been established. Thus, an increasing number of dental students have the opportunity to observe patients with cancer in all stages of the disease and to become familiar with differential diagnosis along with the various methods of therapy. Twenty-four schools demonstrate how to take a biopsy, while in eight schools, the student takes the biopsy and follows through the processing of the specimen to the histologic slide. It is of particular interest that seven schools have established

a biopsy service for practicing dentists under the assistance of this program.

As a means of drawing together the fragments of cancer knowledge which a dental student may have acquired during his dental training, 19 schools conduct tumor conferences as a part of their teaching programs. Significant is the fact that 28 schools have added new cancer courses to their curriculum in which cancer knowledge is correlated and integrated for the student.

Since it is not desirable to separate cancer teaching entirely from that of other disease problems, additional emphasis has been placed on cancer in oral surgery by 23 schools; oral pathology by 27; oral diagnosis by 11; dental medicine by 9; general pathology by 16; roentgenology by 7; prosthetics by 6; biochemistry by 3; and periodontia by 2.

Since research is of paramount importance in effective cancer teaching, 8 schools have undertaken research activities and have established programs which provide students opportunities for investigative work. Lastly, special lectures and seminars have been utilized as a method of increasing cancer instruction in 24 schools. It is particularly noteworthy that all these schools have extended this type of instruction to practicing dentists through local dental societies.

Approximately 3 years have gone by since the initiation of this program by the National Cancer Institute. It is now possible to review its effect and enumerate a number of general accomplishments.

1. Dental educators throughout the Nation have enthusiastically responded to the program.

2. It has increased the dental student's awareness of cancer and has impressed upon him his responsibility for the early recognition of oral cancer.

3. It has aroused the interest of practicing dentists, clinicians, and teachers to the point where they are becoming increasingly aware of the importance of the oral cancer problem to the dental profession.

4. It has increased the curriculum time devoted to cancer teaching.

5. It has assisted in clarifying and defining the role of the dentist in the control of this disease.

6. It has strengthened and expanded the use of visual educational materials in dental schools.

7. It has pointed up the need for cancer instruction in postgraduate fields and has definitely furthered such teaching.

8. It has strengthened cooperative relationships between the medical and dental professions.

9. It has increased cancer facilities and services.

10. It has stimulated the initiation of several studies in clinical and fundamental oral cancer research.

11. It has stimulated and expanded research interests of dental school faculties and has created in dental students an appreciation of the value of scientific research.

12. It has strengthened teaching materials and facilities in all participating schools.

13. It has pointed out to the dentist his opportunity for a very real public health service and the significance of his contribution to cancer control.

14. Lastly, it has accomplished a general improvement in the teaching of oral cancer.

It is gratifying to report the enthusiastic response of the dental educators along with the evident progress that they have made with the limited funds provided by the National Cancer Institute. With this excellent beginning it appears reasonable to believe that the dental profession can contribute more than any other group toward bringing up the cure rate of intra-oral cancer.

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Cancer Research Facilities Construction Grants

Awarded Through the National Cancer Institute by the Public Health Service

By R. G. MEADER, Ph.D., and W. W. PAYNE*

One of the major forces energizing the Federal Government's attack on cancer is the construction grants program of the National Cancer Institute of the Public Health Service.

Complementing the research grants and research fellowships activities of the Institute, the program was established by the 1948 Appropriations Act and was continued by the 1949 and 1950 acts. The acts also described the program's mission: "To make grants-in-aid for research and training projects related to cancer including grants for drawing plans, erection of buildings and acquisition of land therefor."

With this the National Cancer Institute became the first of the National Institutes of Health to administer grants-in-aid for the construction of medical research facilities.

In this young program—administered by the Institute's Grants and Fellowships Branch—63 grants-in-aid totaling $16,303,000 have been awarded. Support has been given to the building of urgently needed clinical and laboratory facilities for cancer research at 47 non-Federal institutions in 27 States and the District of Columbia, most of them medical schools and affiliated hospitals. In nearly all instances Public Health Service grants have supplemented local funds.

A forest fire in Maine brought on the first—and sudden—test of the program's effectiveness. In October 1947 the fire destroyed the buildings of Bar Harbor's noted Roscoe B. Jackson Memorial Laboratory, center of mammalian genetic breeding in the United States. In addition to its own important research on genetics and other factors in the causation of cancer, the Laboratory was the source of large numbers of inbred uniform strains of mice and other animals used in medical research in laboratories throughout the United States and abroad. Cancer investigations and other research all over the country faced a slow-down or halt because of this fire.

Within 2 months after the disaster, an emergency construction grant of $250,000 was awarded by the Surgeon General to help replace

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the main laboratory at Bar Harbor. With this stimulus the Laboratory was able to obtain enough money from other sources to more than match the Public Health Service grant. By the spring of 1949 the main laboratory was completed and in use. Meanwhile, another construction grant, for $100,000, was awarded to help rebuild a second laboratory—completed in the spring of 1950.

In Los Angeles another striking structural improvement was activated by a National Cancer Institute grant. There an old two-story jail building on the County Hospital grounds was converted into a modern cancer research laboratory for the use of the University of Southern California Medical School and the College of Medical Evangelists. In this instance, the National Cancer Institute grant of $35,255 was a supplement to $52,000 of local funds.

In the new seven-story Goldblatt Memorial Hospital for Cancer Research at the University of Chicago—one of the Nation's outstanding cancer hospitals—a $690,000 grant paid for two and one-half floors of laboratories and research beds.

A $20,000 grant enabled Meharry Medical College, Nashville, Tenn., in 1948 to finish construction of a new brick-and-frame laboratory for cancer research. A second grant was made to build quarters for experimental animals used in this research.

How it Started

Actually, the story of the cancer construction grants program began with the end of World War II. Spectacular wartime progress in research had quickened public interest in cancer and encouraged the popular hope that cancer might be conquered. The result, following World War II, was an unprecedented increase in funds for research projects and research training. Very rapidly the number of cancer studies multiplied and the supply of scientist manpower increased. However, Nation-wide expansion of cancer research was slowed by the lack of physical facilities. To remove this bottleneck to further expansion and provide laboratory space for housing new studies of cancer and utilizing the enlarged force of scientists, Congress authorized the cancer research facilities construction grants program.

Program in Action

After the one emergency action in December 1947, 30 grants were awarded during 1948, 22 during 1949, 10 during 1950. By mid-January 1951, 18 projects had been completed, with research facilities in use. Twenty-five others were under construction. For the remainder, plans were being drawn or bids were being received.

Support was provided, in cash or contract authority, during three fiscal years: $2,303,000 in 1948, $8,000,000 in 1949, $6,000,000 in 1950.

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All the grants have been paid from appropriations of the National Cancer Institute. All have been awarded by the Surgeon General, Public Health Service, upon the recommendation of the National Advisory Cancer Council. This body, created in 1937, advises on Institute policy and recommends expenditures for grants-in-aid for cancer research.

Enlarged in October 1950 by Public Law 692 to include leaders in education and public affairs as well as scientists and medical authorities, the Council is made up of 12 appointed members and 3 ex officio members. The ex officio members are the Surgeon General of the Public Health Service and representatives from the Department of Defense and Veterans Administration.

Another important change was enacted by Public Law 692, giving the National Cancer Institute basic authority to make construction grants. Previously, authority for such grants was specified year by year in appropriation acts. However, no further funds for this purpose were included in the appropriation for fiscal year 1951.

The National Cancer Institute construction grants program does not duplicate projects supported by the Hospital Survey and Construction Act (Hill-Burton Act), Atomic Energy Commission, or National Heart Institute. The aim of the National Cancer Institute program is to provide research facilities, while the Hill-Burton program is concerned with building them for medical care and health centers. In some instances, facilities provided by the two programs may be located in the same institution or may be a part of the same project. Institute liaison with the Hospital Facilities Division of the Bureau of Medical Services, Public Health Service, assures that facilities are not duplicated and that money provided by cancer grants is not used as matching money for the Federal share under the Hill-Burton Act.

To prevent duplication of facilities by the heart and cancer construction grants programs and to assure maximum economy in the creation of facilities that could be used in common, technical supervision of both programs is provided in one office by the Research Facilities Engineer of the National Cancer Institute. Liaison with representatives of the Atomic Energy Commission provides coordination with research laboratories built by that agency.

The Guiding Philosophy

In granting public funds for research, including construction, the Public Health Service is guided by the philosophy upon which the scientific method rests, namely, the integrity and independence of the research worker and his freedom from control, direction, regimentation, and outside interference. Only one restriction on the use of the construction grants is applied by the Public Health Service—that is, the facilities must be devoted to investigation of cancer.

The distribution of National Cancer Institute construction funds has been considered from two viewpoints. One indicated that the funds should go to a few large institutions with well-established medical research programs. The other indicated the aid should go to strengthen smaller institutions with limited research resources. Actually, the program has served both purposes. Not only have a number of existing cancer research centers been expanded, but new centers for cancer research have been created also.

Although the largest portion of the funds has gone into the improvement of laboratory facilities, encouragement has been given to the development of a balance between laboratory and clinical facilities. Some institutions with good laboratory facilities have been aided in building up clinical research facilities. In a few instances funds have been given for construction of quarters for animals used in cancer research.

Grants have been made chiefly to medical schools and to hospitals closely affiliated with medical schools. In these cases personnel and facilities are available for both laboratory and clinical research, making possible a broad, well-rounded approach to research problems and facilitating the rapid transfer of laboratory discoveries into clinical evaluation and use. A few grants have gone to institutions devoted chiefly to cancer research even though they are not associated with medical schools or hospitals.

In addition, in selecting grantee institutions the Public Health Service has given preference to (1) those able to contribute a large proportion of construction costs, (2) institutions assuring a substantial share of continued support to research programs to be conducted in the facilities, and (3) institutions actively cooperating in the development of a State cancer control program.

That geographic distribution was considered is evident in the fact that all of the nine United States census regions are represented among the grantees. The census regions and total amount of NCI construction grants received by their institutions are: New England $2,131,272; Middle Atlantic $2,914,044; South Atlantic $2,250,088; East North Central $2,688,650; East South Central $715,599; West North Central $2,416,688; West South Central $425,000; Mountain $816,404; Pacific $1,945,255.

Already some heartening byproducts of the program have been reported by medical school deans. According to the Surgeon General's Committee on Medical School Grants and Finances, these construction grants have stimulated local gifts to medical schools, improved the teaching programs, and boosted the number of cancer patients being referred by general practitioners.

A complete list of cancer research construction grants follows.

Summary of all Public Health Service cancer research construction grants awarded from inception of program through January 1951

Institution	Project	Date of award	Amount of grant
	Alabama		
Medical College of Alabama and the Jefferson County Health Department, Birmingham.	*New laboratory and equipment for studies of cancer diagnostic tests.	Sept. 1948	$47,280
	California		
University of California Medical School, San Francisco.	Facilities for laboratory and clinical research in cancer.	Mar. 1948	1,000,000
University of California Medical School, Los Angeles.	Construction of unit for cancer research in biophysics, epidemiology, radiobiology, biochemistry.	July 1949	700,000
Los Angeles County Hospital, Los Angeles.	*Conversion of old jail building to cancer research laboratory for College of Medical Evangelists and University of Southern California Medical School.	Mar. 1948	35,255
University of Southern California Medical School, Los Angeles.	Facilities for cancer research in new medical center for both cancer and cardiovascular research.	Oct. 1949	200,000
	Colorado		
University of Colorado Medical Center, Denver.	Building for cancer research	Mar. 1948	400,000
	Connecticut		
Yale University School of Medicine, New Haven.	Animal laboratories for expansion of cancer research program.	do	250,000
	District of Columbia		
Georgetown University Medical School, Washington, D. C.	*Construction and equipment for expanding cancer research laboratories, and animal facilities.	Sept. 1948	148,500
George Washington University School of Medicine, Washington, D. C.	Facilities for cancer research in new clinical center.	Oct. 1949	200,000
	*Modernization of laboratories for cancer research.	do	50,000
	Georgia		
Emory University School of Medicine, Atlanta.	Construction and equipment of cancer laboratories in new research building.	June 1948	500,000
	Illinois		
University of Chicago School of Medicine, Chicago.	*Building of laboratory and clinical research facilities.	Mar. 1948	450,000
	*Supplementary grant to enable completion of project above.	July 1949	240,000
Stritch School of Medicine, Loyola University, Chicago.	Remodeling of laboratories to provide facilities for radioisotope studies.	June 1950	47,300
	Indiana		
Indiana University Medical Center, Indianapolis.	New building coordinating clinical and laboratory research in cancer.	do	126,350
	Iowa		
State University of Iowa College of Medicine, Iowa City.	*Facilities for isotope studies	Feb. 1950	12,250
	Kansas		
University of Kansas Medical Center, Kansas City.	Facilities for cancer research in pathology, bacteriology, pharmacology.	July 1949	200,000
	Maine		
Jackson Memorial Laboratory, Bar Harbor, Maine.	*Rebuilding of main laboratory for genetics studies.	Dec. 1947	250,000
	*Rebuilding of one other laboratory destroyed by 1947 fire.	Sept. 1948	100,000

*Projects completed.

Summary of all Public Health Service cancer research construction grants awarded from inception of program through January 1951—Continued

Institution	Project	Date of award	Amount of grant
	Maryland		
Johns Hopkins University Medical Center, Baltimore.	Cancer research facilities in new building adjacent to medical school and hospital.	July 1949	$750,000
	Massachusetts		
Beth Israel Hospital, Boston	Construction of addition to animal building for cancer research.	Feb. 1950	50,000
Boston University School of Medicine	*Enlargement and modernization of animal quarters.	Oct. 1949	49,900
	*Supplementary grant for above project.	Feb. 1950	12,850
Children's Medical Center, Boston	Permanent equipment for the new research building erected by Children's Cancer Research Foundation.	do	100,000
Massachusetts General Hospital, Boston.	Major facilities for cancer research, supplementing new laboratories for cardiovascular and arthritis studies.	Mar. 1948	700,000
New England Deaconess Hospital, Boston.	Construction of 4-story cancer research laboratory.	do	400,000
	Facilities for experimental cancer detection clinic.	July 1949	85,000
Tufts College Medical School, Boston	*Internal renovation for new laboratories and expansion of clinical research facilities in two affiliated hospitals.	Mar. 1948	133,522
	Michigan		
Wayne University College of Medicine and Detroit Institute of Cancer Research, Detroit.	Building and equipment of cancer research laboratory in new addition to Detroit Receiving Hospital.	Oct. 1949	150,000
	Supplementary aid to project above	Feb. 1950	100,000
	Minnesota		
University of Minnesota Medical School, Minneapolis.	Major facilities for laboratory research in cancer.	Mar. 1948	543,550
	Supplementary grant to above	Sept. 1948	135,888
	Supplementary grant to provide clinical facilities.	July 1949	200,000
	Missouri		
Washington University School of Medicine, St. Louis.	Laboratory for cancer research in anatomy, biochemistry, pharmacology, physiology.	Mar. 1948	450,000
	Clinical cancer research facilities	Sept. 1948	250,000
St. Louis University School of Medicine, St. Louis.	Construction of cancer research institute.	July 1949	625,000
	New York		
Columbia University, College of Physicians and Surgeons, New York.	*Construction and equipment of cancer laboratories for research in genetics, biology, biophysics, immunology, enzyme chemistry, isotope studies, and other cancer studies.	Mar. 1948	1,000,000
Memorial Center for Cancer and Allied Diseases, New York.	Construction of laboratory for experimental surgery.	July 1949	250,000
N. Y. University—Bellevue Medical Center, New York.	Provision of laboratory and clinical cancer research facilities in new medical center.	Mar. 1948	575,000
University of Rochester School of Medicine, Rochester.	*Facilities for cancer control and cancer research.	June 1948	434,368
	North Carolina		
Duke University School of Medicine, Durham.	Addition of cancer laboratories to research building.	Oct. 1949	200,000
University of North Carolina School of Medicine, Chapel Hill.	Addition of cancer research laboratories to new outpatient and clinical research building.	Feb. 1950	200,000

*Projects completed.

Summary of all Public Health Service cancer research construction grants awarded from inception of program through January 1951—Continued

Institution	Project	Date of award	Amount of grant
	Ohio		
Ohio State University College of Medicine, Columbus.	Cancer laboratories in wing added to new 600-bed hospital.	Oct. 1949	$300,000
Western Reserve University School of Medicine and University Hospitals of Cleveland.	Clinical and laboratory facilities for cancer research.	do	300,000
	Oklahoma		
Oklahoma Medical Research Foundation, Oklahoma City.	Clinical facilities for cancer studies in new research institute.	do	125,000
	Oregon		
University of Oregon Medical School, Portland.	*Remodeled cancer research isotope laboratory.	Mar. 1948	10,000
	Pennsylvania		
Institute for Cancer Research, Philadelphia.	*Equipment for new cancer research institute.	do	149,000
	*Same as above	Mar. 1949	49,468
University of Pennsylvania School of Medicine, Philadelphia.	*Improvements in and equipment for existing cancer laboratories in Department of Pathology.	Mar. 1948	56,208
	Building and equipping part of new diagnostic clinic to house cancer research facilities.	July 1949	200,000
University of Pittsburgh Medical School, Pittsburgh.	Clinical and laboratory facilities for cancer research.	Oct. 1949	200,000
	South Carolina		
Medical College of the State of South Carolina, Charleston.	*Housing for animals used in cancer research.	Sept. 1948	16,000
	Cancer laboratories in new medical center.	Feb. 1950	100,000
	Tennessee		
Meharry Medical College, Nashville	*New laboratory for cancer studies	Mar. 1948	20,000
	*Facilities for experimental animals	Mar. 1949	30,385
University of Tennessee College of Medicine, Memphis.	4-story building for cancer research	Mar. 1948	491,584
Vanderbilt University School of Medicine, Nashville.	Cancer research laboratories	June 1950	126,350
	Texas		
University of Texas, M. D. Anderson Hospital, Houston.	Research laboratories in new cancer hospital.	June 1948	200,000
	Supplementary to above	Oct. 1949	100,000
	Utah		
University of Utah Medical School, Salt Lake City.	Laboratory building for cancer research in new medical center.	Mar. 1948	416,400
	Virginia		
Medical College of Virginia, Richmond	*Building alterations to provide clinical research facilities.	do	10,588
University of Virginia School of Medicine, Charlottesville.	Laboratory building centralizing cancer clinics and laboratories.	do	75,000
	Wisconsin		
University of Wisconsin Medical School, Madison.	Construction for clinical cancer research.	do	975,000

*Projects completed.

An Achievement Examination in the Subject of Cancer for Medical School Students

By Howard R. Bierman, M.D.,* and James N. McClelland, Ph.D.**

An achievement examination in the subject matter of cancer has been in the process of development at the University of California School of Medicine during the past 3 years. The examination was administered to 9,358 individuals in 32 four-year medical schools in the spring of 1949. This report deals with the development of the test and the results of its administration on a Nation-wide scale.

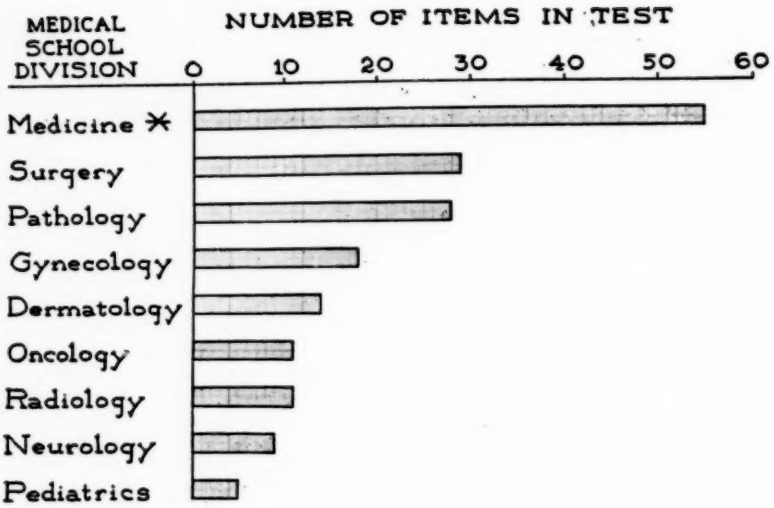
Development of the Test

The test was originally conceived as a device for measuring improvement in cancer instruction and student knowledge at the University of California School of Medicine, resulting from the program for bettering cancer teaching. An objective multiple-response type of measure was chosen rather than an essay test or other form of objective type test, on the basis that such a test (1) was most reliable as a before-and-after measure of student learning; (2) would obtain a comprehensive sample of student cancer learning in a short time; and (3) was most adaptable to a school-wide testing program in which the physical labor of scoring an essay test would be prohibitive.

All members of the faculty who taught any aspect of the subject matter of cancer were asked to contribute questions for the test. These questions were to test retention of cancer information, and the ability to apply this information in problems arising in typical cases, which these instructors believed should have been acquired by the student in the course of his medical school career. Other items calculated to increase the range and comprehensiveness of the test were then prepared by the staff of the Laboratory of Experimental Oncology.[1] Items were collected and grouped according to anatomical systems involved and whether the question dealt primarily with diagnosis, treatment, pathology of tumors, etiology, vital statistics, etc. The proportion of test items selected for each of the test subdivisions was determined by three factors: (1) a questionnaire directed to the chairmen of the medical school departments concerned with

*From the Laboratory of Experimental Oncology, National Cancer Institute, and the Division of Medicine, University of California School of Medicine, San Francisco, Calif. **Cancer Research Institute, University of California School of Medicine, San Francisco, Calif. The study was supported by a grant from the Cancer Control Branch of the National Cancer Institute, Bethesda, Md.

[1] A section of the National Cancer Institute at the University of California Medical School.



* Includes some very general questions not otherwise classified.

Figure 1. Number of items in the 1949 achievement examination in the subject matter of cancer, measuring achievement in various medical school subjects.

cancer instruction; (2) the number of hours of formal instruction in cancer in each department of the school; and (3) the known incidence of lesions in various physiological systems and anatomical locations.

Items were scrutinized carefully for accuracy of subject matter, ambiguities, specific determiners, and other factors which might adversely affect the validity of the test. The distribution of the 180 items according to the department of the school submitting them is shown in figure 1.

Two representative test items are given below:

1. The symptoms of pheochromocytoma can be reproduced or caused by excessive secretion of:

a. Desoxycorticosterone.
b. Epinephrine.
c. Corticosterone.
d. Posterior pituitary pressor substance.
e. Renin through renal ischemia.

2. You have, in your opinion, adequately studied a man, aged 23, with abdominal pain. The characteristics of this pain are compatible with a peptic ulcer. The pain has been present over a 1-year period, and during this period the patient has lost 10 pounds in weight. The radiologist has reported to you that an ulcer is present in the first portion of the duodenum. The most important consideration to you in concluding that a benign ulcer is present, rather than a malignant one, is the:

a. Age.
b. Duration of the pain.
c. Presence of free acid in the gastric secretion.
d. Loss of only 10 pounds in weight.
e. Location of the ulcer.

The Revised Test

The test was first given to 279 students and 22 interns of the University of California School of Medicine in May 1948 (*1*). The results of this test in the local school were so promising that other schools became interested in employing it on the basis that information thus obtained might be helpful in assisting a school's efforts to improve its instruction. Consequently, a circular letter concerning the interest of their schools in participating in such a program was addressed to the cancer coordinators in all the schools which were recipients of the National Cancer Institute grants for improving cancer teaching. Schools were assured that results from participating institutions would be kept confidential. The response was much greater than had been anticipated, and accordingly, in consultation with, and with the financial support of, the National Cancer Institute, a special project for carrying out the projected testing program was created.

In preparation for the larger project of administering the test on a Nation-wide scale, the test was revised considerably because several of the original items were primarily of local interest and thus were inappropriate for other schools. Furthermore, as is inevitable with the first administration of a test, some of the items did not contribute appreciably to the range of scores on the test, were poor discriminators between those who knew the subject well and those who did not (on the basis of total test scores), or contained distracters (words of more than a single meaning), etc. New items were sought from many experts in the field to make the test more comprehensive of cancer knowledge and to replace items judged inappropriate in the original test.

As finally constituted, the revised form of the test contained 180 five-choice multiple-response items—109 were identical to items in the pilot test, and the remaining 71 varied from minor changes of a word or two to completely new items. Items ranged greatly in difficulty from those easy for the average medical school freshman to those too difficult for most senior students.

Every effort was made to sample the whole field of cancer (table 1) and to keep the test free from controversy, a very difficult task in an area in which so little can be stated unequivocally. The student was permitted 1 hour and 55 minutes for answering the questions, or approximately 40 seconds per item. This is a rate somewhat slower than customary for items of this type, but because of the technical terminology and because of the original testing experience, the total test time was left unchanged, thereby making the examination a power rather than a speed test. Students were instructed to answer all questions as it was felt this procedure would aid in standardizing the administration and scoring of the test.

944591—51—3

Table 1. *Cross-index of distribution of items of achievement test, 1949 edition*

Questions involving primarily	Physiological system or anatomical site (number of items)					
	Respiratory	Digestive	Male genito-urinary	Female genitourinary and breast	Nervous	Hematopoietic
Diagnosis	7	22	8	10	6	5
Treatment	2	5	5	5	----	3
Pathology	4	9	3	14	3	2
Etiology	----	----	----	2	----	1
Total	13	36	16	31	9	11
Percent of total test	7	21	9	17	5	6

Questions involving primarily	Bone	Skin	Soft tissue	Endocrine	Experimental	Miscellaneous
Diagnosis	3	6	1	3	----	1
Treatment	1	6	1	1	----	3
Pathology	2	7	3	8	----	5
Etiology	----	3	1	----	7	2
Total	6	22	6	12	7	11
Percent of total test	3	12	3	7	4	6

The examination was administered to 9,358 individuals in 32 four-year medical schools in the United States during a 1-month period in April and May of 1949 (table 2). The schools in the program were distributed geographically in such a manner as to form a representative cross section of all the schools in the country.

It will be noted that the minimum number of students tested at any of the four academic levels was 1,810. Of the 364 examinees listed under the miscellaneous column, 39 were premedical school students and most of the remainder were interns, residents, and faculty members.

Test Results

Norms for the test were established on the basis of the total number of students taking the test, omitting the students at the University of California School of Medicine where the test was prepared originally, and certain other student groups which did not conform with the usual procedure of promoting students from one class to another in June of each year (table 3). These latter students were omitted because their achievement was not directly comparable with the achievement of students in the more conventional curricula.

Scores overlapped considerably between adjacent student groups. However, differences between the means of adjacent groups were significant beyond the 1 percent level in all instances.[2] Coefficients

[2] At the 1 percent level there is only one chance in 100 that a difference as large or larger than that obtained could have arisen by chance if there were no difference between the groups tested.

Table 2. *Number of individuals taking the 1949 achievement examination in the subject matter of cancer*

College*	Freshman	Sophomore	Junior	Senior	Miscellaneous
Albany Medical College	48	45	48	37	11
University of California School of Medicine	70	67	72	65	67
University of Chicago Medical School	68	60	41	----	4
College of Medical Evangelists	95	77	74	54	2
Creighton University School of Medicine	76	70	63	39	1
Duke University School of Medicine	75	69	19	49	----
Emory University School of Medicine	66	62	53	33	1
Georgetown University School of Medicine	113	104	77	55	10
University of Georgia School of Medicine	81	79	80	63	4
Howard University College of Medicine	69	66	60	48	1
University of Kansas School of Medicine	76	73	58	57	28
Louisiana State University School of Medicine	97	86	71	54	3
Marquette University School of Medicine	92	90	79	39	7
University of Michigan Medical School	138	112	93	106	19
University of Minnesota Medical School	109	108	87	81	18
University of Nebraska College of Medicine	85	80	71	41	31
New York Medical College	120	122	98	95	35
New York University College of Medicine	----	----	104	38	----
Ohio State University College of Medicine	80	75	64	49	1
University of Oklahoma School of Medicine	59	60	73	51	7
University of Oregon Medical School	70	71	56	59	1
Southwestern Medical College	63	58	58	54	----
Syracuse University College of Medicine	51	49	37	43	9
Temple University School of Medicine	134	121	104	93	1
University of Tennessee College of Medicine	106	97	99	109	10
Tulane University of Louisiana School of Medicine	114	131	110	110	4
University of Utah College of Medicine	----	47	47	35	39
Medical College of Virginia	77	74	94	57	22
University of Virginia Department of Medicine	72	67	60	55	14
University of Washington School of Medicine	41	46	42	----	4
George Washington University School of Medicine	85	80	75	68	5
Western Reserve University School of Medicine	81	77	83	73	5
Total	2,511	2,423	2,250	1,810	364

*Alphabetical listing.

of reliability were obtained by the split half method (*2*), using odd and even numbered items to form the two halves, with representative samples of 400 students drawn from each of the freshman, sophomore, junior, and senior groups (table 4). In view of the relative homogeneity of the groups tested, the reliability coefficients were satisfactorily high and the over-all reliability of 0.94 indicates a very high degree of consistency among the test items.

The validity of the test, that is, the extent to which it really does measure student knowledge of the subject matter of cancer, cannot be assessed easily since there is no comparable measure of cancer knowledge which can be used as a criterion. The test has been read by many experts in the field of oncology, including most of the cancer coordinators in the schools where the test was given. Although there were occasional adverse criticisms of individual items, it was the general consensus that the test as a whole appeared to be adequately comprehensive and that it should measure student knowledge of cancer with a high degree of accuracy. Validation based on opinions such as these, while not absolute, is highly encouraging.

Table 3. *1949 cancer test norms for students from 4-year medical schools*

Class	Number of students	Average score [1]	Standard deviation
Freshman	2,335	50.98	9.04
Sophomore	2,212	80.39	13.85
Junior	2,068	98.24	14.56
Senior	1,636	107.37	14.53

[1] 180 possible. Uncorrected for guessing.

Table 4. *Corrected coefficients of reliability for the 1949 cancer test, based on scores of 400 students from each academic level* [1]

	Freshman	Sophomore	Junior	Senior	All groups combined
Coefficient of reliability	0.64	0.81	0.84	0.84	0.94
Standard error of reliability coefficient	.03	.02	.02	.02	.01

[1] Reliability coefficients were corrected by the Spearman-Brown prophecy formula.

Norms for the test have been plotted, together with zones within which lie 50 percent and 90 percent of the average scores of all the classes (fig. 2). Plots have also been made of the average scores of students in all schools giving the test (figs. 3–6). There is no indication of significant differences between schools on a geographical basis, and the groupings depicted are for purposes of convenience only. It will be noted from these figures that there are wide differences in scores from school to school, and these differences tend to increase with each succeeding class year as each class receives more education in oncology. The greatest increases in score appear generally to occur during the sophomore year. Most schools tend to maintain their same relative positions in comparison to other schools participating from one student year level to another, although there are a few notable exceptions.

The subject matter of the test was analyzed item by item, since various trial groupings of items seemed to yield no factors with any great degree of independence. A separate report made to each school showed the percent of students in each academic year answering each item correctly and also how this percent compared with the percent answering correctly at other year levels and in other schools. The report was made in the form of tables. The items were grouped according to the department of the school considered most responsible for teaching the information tested, with brief, general descriptions of the subject matter of the items. Table 5 is a copy of part of one page of one of these reports.

In the tables the relative performance of the particular class was shown by one of three symbols, *H*, *M*, or *L*, which have the following meanings:

H: Indicates that the percent of students in this class answering

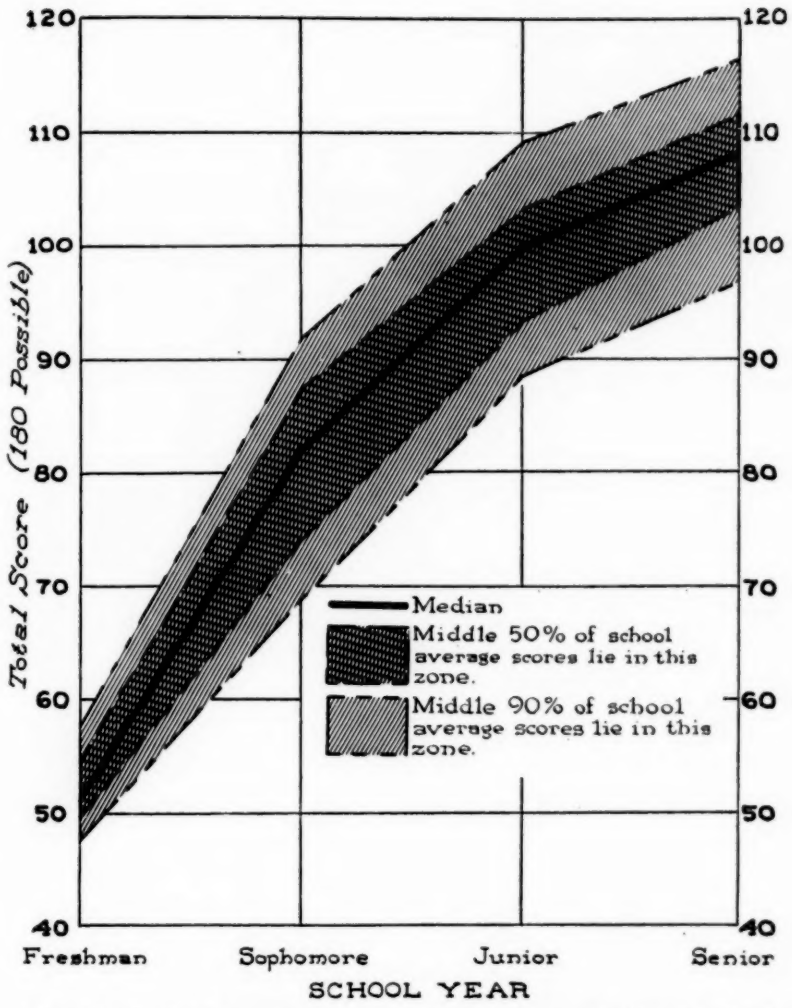


Figure 2. Distribution of average scores on 1949 cancer examination for all schools participating, by classes. Note increasing range of scores and decreasing yearly gains at the upper academic levels.

this item correctly placed the class in the *highest* 20 percent of all classes at that academic level. Presumably, students in this class knew more about the subject tested by this item than did students at the same academic level in 80 percent of the schools enlisted in the program.

M: Indicates that the percent of students in this class answering the questions correctly placed the class in the *middle* 60 percent of all classes at that academic level.

L: Indicates that the percent of students in this class answering the questions correctly placed the class in the *lowest* 20 percent of all classes at that academic level.

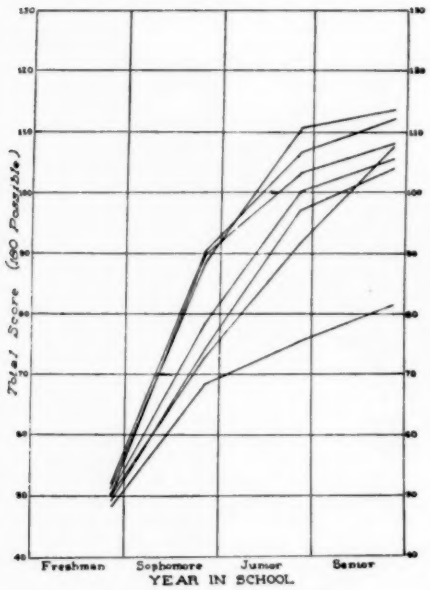


Figure 3. Average scores on 1949 cancer examination for students in seven Eastern medical schools.

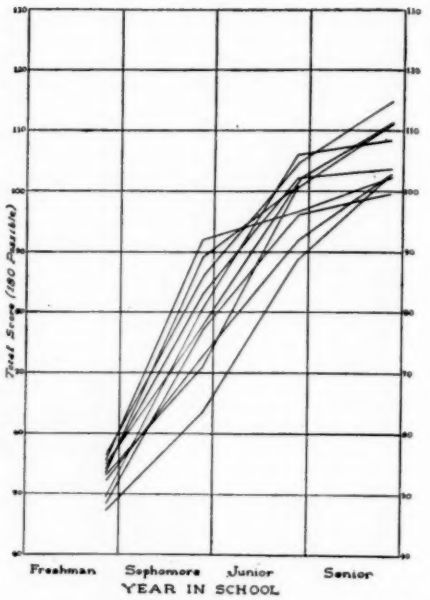


Figure 4. Average scores on 1949 cancer examination for students in 10 Midwestern medical schools.

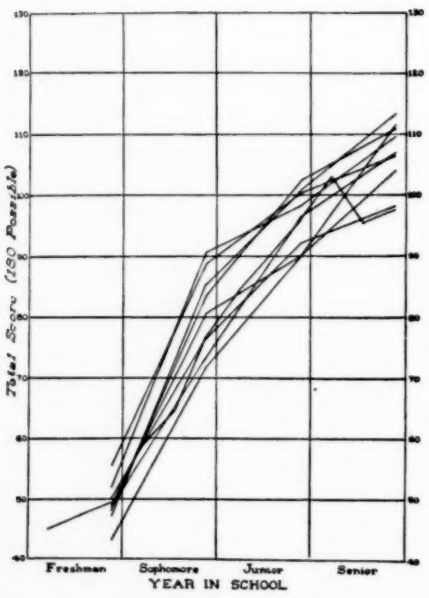


Figure 5. Average scores on 1949 cancer examination for students in nine Southern medical schools.

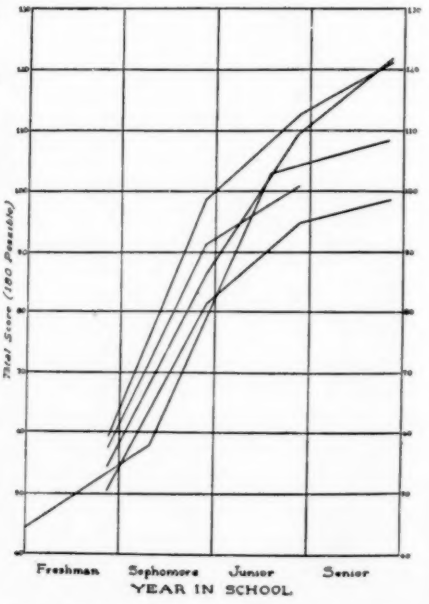


Figure 6. Average scores on 1949 cancer examination for students in five Western medical schools.

Table 5. *Example of methods for reporting results of 1949 cancer achievement test, item by item*

GYNECOLOGY

Item	Cancer topic	Percent score and standing			
		Freshman	Sophomore	Junior	Senior
12	Precancerous lesions of genitourinary tract	36	84	93	100
		H	M	H	H
17	Physiology of gynecological tumors	66	94	97	95
		M	H	H	H
55	Symptomatology of gynecological tumors	11	54	86	62
		L	H	H	H
63	Etiology of gynecological cancer	65	70	74	92
		H	M	L	M
95	Characteristics of gynecological tumors	10	28	44	63
		L	M	M	H

For example, for an item described thus:

Item	*School Y*	*Freshman*	*Sophomore*	*Junior*	*Senior*
49	Symptomatology of intracranial tumors	34	45	58	75
		H	M	M	M

the interpretation would be as follows:

Although more of the students at the higher academic levels (junior and senior) seem to know the answer to this question than do the lower classmen, the increase in score from one level to another is not as great as in most schools. Hence, even though the 34 percent of freshmen answering the item correctly places this group among the *highest* 20 percent of all freshmen classes, the 75 percent of the seniors answering the item correctly is sufficient only to put that group in the *middle* 60 percent of all senior groups taking the test. It should not be overlooked that even though a score may have an *H* rating, this does not indicate that learning of the material tested has been satisfactory. It only indicates that learning is relatively high in the group to which the rating is given compared with other student groups at the same level.

In the tables, the item numbers correspond to the item numbers of the test, but the description accompanying the item numbers relate to the subject areas and not the items themselves. This procedure was adopted so that any influence the report might have on instruction would be on a broader, more comprehensive basis than might result if each test item were described exactly, and also to preserve the individual test item for use in future editions of the test.

Complete reporting of the results of the program is not feasible, but a few senior student scores on some of the test items are interesting. For example:

1. Seventy-four percent of the seniors believed that only about 5 percent of patients with untreated carcinoma of the breast survive 5 years.

2. Sixty-four percent of the seniors did not know that monocytic leukemia is rapidly fatal. Twenty-seven percent did not know that it produces splenomegaly.

3. Fifty-one percent of the seniors did not recognize the sudden appearance of Jacksonian convulsions in an adult as suggestive of the possible presence of new growth in the brain.

4. Thirty percent of the seniors checked leukorrhea instead of metrorrhagia as the most frequent symptom of carcinoma of the cervix.

5. Sixty-four percent of the seniors did not know in which location of the stomach carcinoma would offer the best prognosis.

6. Seventy-six percent of the seniors did not recognize enlargement of the breasts in the male as a symptom of carcinoma of the testis.

7. Fifty-eight percent of the seniors did not check vomiting as a frequent first manifestation of tumors of the central nervous system in children.

8. Sixty-two percent of the seniors did not know that xeroderma pigmentosum is a precancerous lesion.

It is appropriate to emphasize that these results were obtained from students about to graduate. It is clear that many students are graduating today lacking important knowledge which they should have concerning the diagnosis and treatment of cancer.

Continuation of the Program

Cancer coordinators and other interested faculty members in schools where the test was given in 1949 have found the results very useful in planning their cancer teaching program. Although implications of the testing program are many, the test will not have accomplished entirely the purpose for which it was intended until it can be readministered several times in each school to measure possible changes in cancer learning that should take place as a result of the increased emphasis now being placed on cancer in medical schools throughout the country.

Therefore, present plans call for the test to be readministered in all cooperating schools each year for 5 years. By that time it should be possible to determine to some extent the relative effectiveness of the numerous instructional methods now being tried out and to gain considerable insight into the general effectiveness of medical educational programs.

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(*2*) Tiegs, Ernest W.: Tests and Measurements in the Improvement of Learning. Boston, Houghton Mifflin Co., 1939, pp. 384 and 490.

Industrial Sickness Absenteeism Third and Fourth Quarters, 1950

By W. M. Gafafer, D.Sc.*

The accompanying data on 8-day or longer disabilities experienced by male employees during the third and fourth quarters of 1950 are derived from periodic reports submitted by industrial sick benefit associations, company relief departments, and group health insurance

Table 1. *Number of absences per 1,000 males (annual basis) on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause; experience of male employees in various industries, third and fourth quarters of 1950* [1]

Cause [2]	Number of absences per 1,000 males (annual basis) beginning in specified period						
	Fourth quarter		Third quarter		Year		
	1950	1949	1950	1949	1950	1949	1945–49
Sickness and nonindustrial injuries	102.3	84.4	94.6	80.3	112.4	94.0	113.8
Nonindustrial injuries (169–195)	13.4	10.6	13.6	11.4	13.4	11.0	12.2
Sickness	88.9	73.8	81.0	68.9	99.0	83.0	101.6
Respiratory diseases	27.1	23.7	18.5	15.4	33.4	26.2	38.0
Tuberculosis of respiratory system (13)	.3	.8	.6	.5	.5	.7	.7
Influenza, grippe (33)	7.1	6.5	4.0	2.7	10.7	7.6	13.8
Bronchitis, acute and chronic (106)	6.0	4.0	3.2	2.7	5.9	4.3	6.3
Pneumonia, all forms (107–109)	4.3	4.0	3.2	2.5	5.2	4.0	4.2
Diseases of pharynx and tonsils (115b, 115c)	2.9	2.1	2.5	2.6	3.1	3.3	4.2
Other respiratory diseases (104, 105, 110–114)	6.5	6.3	5.0	4.4	8.0	6.3	8.8
Digestive diseases	17.9	14.9	19.0	15.6	19.0	16.6	17.4
Diseases of stomach except cancer (117, 118)	5.9	5.3	5.9	4.5	5.8	5.2	5.8
Diarrhea and enteritis (120)	2.2	1.5	2.4	2.2	2.5	2.0	2.2
Appendicitis (121)	4.0	2.7	4.7	3.5	4.1	3.5	3.5
Hernia (122a)	2.2	2.5	2.5	2.8	2.7	2.7	2.5
Other digestive diseases (115a, 115d, 116, 122b–129)	3.6	2.9	3.5	2.6	3.9	3.2	3.4
Nonrespiratory-nondigestive diseases	40.2	32.4	40.1	35.7	42.9	37.7	42.4
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [3]	2.1	1.5	2.0	1.7	2.8	2.3	2.7
Rheumatism, acute and chronic (58, 59)	2.9	3.1	3.1	3.3	3.4	3.8	4.7
Neurasthenia and the like (part of 84d)	1.3	1.3	1.4	1.1	1.4	1.5	1.9
Neuralgia, neuritis, sciatica (87b)	2.0	1.6	1.9	2.0	2.0	2.0	2.8
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	1.9	1.8	1.9	1.8	2.2	1.8	1.9
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	7.3	6.2	6.5	6.3	7.7	6.8	7.2
Other diseases of genitourinary system (133–138)	3.7	3.2	4.1	3.2	4.1	3.2	3.2
Diseases of skin (151–153)	3.9	2.4	4.0	3.2	3.5	2.9	3.5
Diseases of organs of movement except diseases of joints (156b)	2.8	1.9	2.9	2.2	3.0	2.4	3.1
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	12.3	9.4	12.3	10.9	12.8	11.0	11.4
Ill-defined and unknown causes (200)	3.7	2.8	3.4	2.2	3.7	2.5	3.8
Average number of males	161,415	187,473	167,804	193,068	161,173	195,290	1,000,183

[1] Industrial injuries and venereal diseases are not included.
[2] Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939.
[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

*From Division of Industrial Hygiene, Public Health Service. The report for the first and second quarters of 1950, and for the year 1949 appeared in Pub. Health Rep. **65**: 1556-1561 (1950); reprint No. 3059.

plans. These reports covered approximately 170,000 male workers in various industries.

The third and fourth quarter rates for 1950 are generally above the corresponding rates for 1949; thus, the rates for sickness and nonindustrial injuries show an increase of about 20 percent for each of the two quarters. Similar increases are noted for the digestive group of diseases.

The third and fourth quarter rates for sickness and nonindustrial injuries during the past 10 years increased to a high in 1945 of 120.1 and 157.6 per thousand, respectively, and then decreased during the period 1945–49. The rates for 1950 are thus introducing what might well become the beginning of an upward trend, a phenomenon that would be in harmony with past experiences which have yielded higher sickness rates in the presence of increased industrial activity.

Incidence of Disease

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

Reports From States for Week Ended May 26, 1951

Poliomyelitis cases increased slightly in the current week to 88 compared with 78 for the previous week. Of the 88 cases reported, 15 occurred in Texas, 14 in California, 7 in Arizona, and 5 in West Virginia. No other State had more than 5. For the same week in 1950, 102 cases were reported—39 in Texas, 9 in California, 7 in New York, 6 in Iowa, and 5 in Arizona. Since March 15, which is about the low point in poliomyelitis incidence, 648 cases have been reported as compared with 747 for the same period in 1950.

Of the total 13 cases of Rocky Mountain spotted fever reported for the current week, 8 occurred in the South Atlantic States and 2 in the Mountain and Pacific States. Of 18 cases which have been reported in the South Atlantic States since April 21, 6 were in Maryland, 7 in Virginia, and 4 in North Carolina. A large majority of the cases reported in this area are reported from these 3 States.

Epidemiological Reports

Infectious Hepatitis

Dr. C. R. Freeble, Jr., Ohio Department of Health, reports an outbreak of infectious hepatitis in Green County. The first case, which gave a history of a previous attack, occurred late in March. Thirty recognized cases followed in children in grades 1 through 5 of the local school. Secondary cases occurred in five homes. Upper respiratory manifestations preceded the onset of jaundice in many instances. Other symptoms noted were headache, loss of appetite, nausea and vomiting, abdominal pain, and, occasionally, diarrhea. Dr. G. E. Savage, local health commissioner, who made the investigation, reported that other children had digestive disturbances during the outbreak but did not develop jaundice. Sixty-eight cases of hepatitis were reported for the entire State for the week ended May 26.

Dr. L. E. Burney, Indiana Health Commissioner, reports that an outbreak of infectious hepatitis has occurred in Indiana, principally in the northern tier of counties. Cases have also been reported generally over the State. A total of 65 cases has been reported.

Trachoma

Dr. W. L. Halverson, California Director of Health, has reported that several cases of trachoma were found among Indians living on one rancheria. An investigation by an ophthalmologist revealed that among the 25 Indians, 9 had active infections, 8 showed evidence of old inactive infections, and the remaining 7 had no evidence of disease.

Diphtheria

Dr. W. L. Halverson reports five cases of diphtheria in Humboldt County, three of which occurred in the city of Eureka. All had onset between May 9 and 22, inclusive. Only one of the five cases was in a child. In this same area, 10 cases with 2 deaths were reported in January and February 1951.

Gastroenteritis

Dr. R. M. Albrecht, New York State Department of Health, reports that the investigation of an outbreak of food poisoning among persons who ate a turkey dinner at a snack bar in Suffolk County reveals presumptive evidence of canned peas being the vehicle. Only those who ate the peas became ill.

Rubella

Dr. L. E. Burney, Indiana Health Commissioner, reports that during the interval April 1 to May 23 a total of 479 cases of rubella was reported in the State, 235 of this number being accounted for by one county.

Influenza

The Influenza Information Center, National Institutes of Health, reports that seven paired serum specimens tested by Dr. Morris Schaeffer, Director of the Regional Laboratory at Montgomery, Alabama, showed significant rises in titer against influenza virus as follows: one against influenza virus A (PR–8) and one against A-prime (FM–1) received from North Carolina; and two against influenza virus A (PR–8), two against A-prime (FM–1), and one against influenza virus B (Lee) received from Oklahoma.

The World Health Organization reports that the strain of virus isolated during the April epidemic in the Netherlands apparently belongs to type B and not to type A as had been announced previously.

Diseases of Unknown Etiology

Dr. R. O. Saxvik, North Dakota Health Officer, reports that for the past several weeks the Red River Valley area in North Dakota has experienced an outbreak of a bizarre disease, the diagnosis of which has not been established. In and around Fargo, 20 cases have been reported which are characterized as follows: The onset was usually sudden and febrile, with temperatures ranging up to 104°.

It has been associated with very severe headache and considerable disability and stiffness of the neck. Spinal fluid findings have been entirely negative and signs of peripheral nervous system involvement have been absent. The disease has lasted 4 to 5 days and has disappeared without sequelae. Although 20 cases have occurred, many others, mostly mild, have been suspected in the Red River Valley. Blood and spinal fluid specimens have been sent to the Public Health Service Rocky Mountain Laboratory and to the North Dakota State Health Department Laboratory for further study.

Comparative Data For Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median, 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median, 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median, 1946–50
	May 26, 1951	May 27, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	1	2	2	(1)	(1)	(1)	(1)	36	18	21
Diphtheria (055)	56	67	151	27th	4,612	7,033	10,274	1,705	2,762	3,916
Encephalitis, acute infectious (082)	31	12	11	(1)	(1)	(1)	(1)	350	274	186
Influenza (480–483)	575	589	498	30th	127,219	146,038	146,038	112,677	135,454	126,001
Measles (085)	22,285	15,067	19,834	35th	393,074	226,365	454,509	364,373	207,237	419,563
Meningitis, meningococcal (057.0)	64	62	62	37th	3,074	2,825	2,799	2,113	1,911	1,827
Pneumonia (490–493)	824	1,236	(2)	(1)	(1)	(1)	(1)	[3]38,046	49,569	(2)
Poliomyelitis, acute (080)	88	102	102	11th	648	747	704	1,860	1,878	1,077
Rocky Mountain spotted fever (104)	13	11	13	(1)	(1)	(1)	(1)	47	52	65
Scarlet fever (050)[4]	1,667	1,139	1,781	32d	61,369	50,948	74,434	45,678	34,509	51,890
Smallpox (084)			4	35th	13	41	66	5	21	45
Tularemia (059)	17	18	20	(1)	(1)	(1)	(1)	291	421	421
Typhoid and paratyphoid fever (040, 041)[5]	49	75	75	11th	418	520	539	853	1,030	1,030
Whooping cough (056)	1,545	2,852	1,914	39th	[6]53,883	77,383	74,737	[6]32,281	55,847	43,471

[1] Not computed.
[2] Data not available.
[3] Additions: Week ended May 12—Tennessee, 56 cases; week ended May 19—Virginia, 60, West Virginia, 27, and Florida, 6.
[4] Including cases reported as streptococcal sore throat.
[5] Including cases reported as salmonellosis.
[6] Addition: West Virginia, week ended May 19, 80 cases.

NOTE.—Maine, week ended Apr. 7, change in diagnosis of 1 case typhoid fever to paratyphoid B.

Reported Cases of Selected Communicable Diseases: United States, Week Ended May 26, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**56**	**31**	**575**	**22,285**	**64**	**824**	**88**
New England	**5**		**15**	**1,105**	**5**	**34**	
Maine			14	35	1	12	
New Hampshire			1	17	1	1	
Vermont				115			
Massachusetts	5			590	3		
Rhode Island				26			
Connecticut				322		21	
Middle Atlantic	**6**	**11**	**1**	**4,295**	**9**	**69**	**5**
New York	2	3	(1)	1,828	7	38	4
New Jersey	2	8	1	1,011		26	
Pennsylvania	2			1,456	2	5	1
East North Central	**3**	**7**	**11**	**4,159**	**11**	**133**	**11**
Ohio	1			890	5		
Indiana		1	7	128		20	2
Illinois	1	1	2	603	2	66	4
Michigan	1	5	2	649	3	47	2
Wisconsin				1,889	1		3
West North Central	**3**	**1**	**17**	**1,147**	**7**	**20**	**6**
Minnesota	1			122	2	3	
Iowa				147			2
Missouri			5	229	4		1
North Dakota		1	12	106		10	
South Dakota				26			
Nebraska	1			15	1		3
Kansas	1			502		7	
South Atlantic	**12**	**1**	**199**	**1,884**	**6**	**74**	**14**
Delaware				36			
Maryland	1		2	256		33	1
District of Columbia				63			
Virginia	2		187	797	1	22	
West Virginia	3			375			5
North Carolina	4			77	1		3
South Carolina	2		2	26	1	12	1
Georgia			8	125	2	7	2
Florida		1		129	1		2
East South Central	**7**	**5**	**22**	**585**	**9**	**105**	**4**
Kentucky	1		4	191	2	22	
Tennessee	4	3	16	134	3		1
Alabama	2			237	4	61	2
Mississippi		2	2	23		22	1
West South Central	**7**	**4**	**122**	**2,705**	**9**	**283**	**19**
Arkansas	1		84	213	3	29	1
Louisiana			1	230	1	38	3
Oklahoma		2	37	299	3	26	
Texas	6	2		1,963	2	190	15
Mountain	**6**	**1**	**159**	**1,068**		**59**	**10**
Montana			15	81		4	
Idaho				126			2
Wyoming				78		1	
Colorado	4		8	175		21	1
New Mexico	2			155		13	
Arizona		1	136	393		20	7
Utah				56			
Nevada				4			
Pacific	**7**	**1**	**29**	**5,337**	**8**	**47**	**19**
Washington				1,025		5	4
Oregon	1		20	658	1	11	1
California	6	1	9	3,654	7	31	14
Alaska			4				
Hawaii			7	21			

[1] New York City only.

Anthrax: New Jersey, 1 case.

Reported Cases of Selected Communicable Diseases: United States, Week Ended May 26, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

Area	Rocky Mountain spotted fever (104)	Scarlet fever (050)	Smallpox (084)	Tularemia (059)	Typhoid and paratyphoid fever [1] (040, 041)	Whooping cough (056)	Rabies in animals
United States	**13**	**1,667**		**17**	**49**	**1,545**	**177**
New England		**175**			**3**	**71**	
Maine		18				21	
New Hampshire		[2] 6				2	
Vermont		3				15	
Massachusetts		120			3	10	
Rhode Island		9				15	
Connecticut		19				8	
Middle Atlantic		**328**			**4**	**123**	**12**
New York		[2] 180				43	7
New Jersey		55				51	
Pennsylvania		93			4	29	5
East North Central	**2**	**590**			**4**	**258**	**27**
Ohio	1	137			1	37	3
Indiana		20				56	18
Illinois	1	55			2	19	1
Michigan		351			1	79	4
Wisconsin		27				67	1
West North Central		**60**				**80**	**51**
Minnesota		19				4	3
Iowa		3				25	17
Missouri		13				9	28
North Dakota		1				17	
South Dakota		11				5	
Nebraska		1				4	2
Kansas		12				16	1
South Atlantic	8	**72**		**5**	**14**	**163**	**16**
Delaware		2					
Maryland	1	21		1		5	
District of Columbia		7				1	
Virginia	4	12		2	1	44	2
West Virginia		5					6
North Carolina	2	11				71	
South Carolina		5			4	3	
Georgia	1	2		2	6	24	8
Florida		[2] 7			3	15	
East South Central	1	**38**			**6**	**180**	**31**
Kentucky		14			2	52	12
Tennessee	1	20			1	31	8
Alabama		2			2	76	6
Mississippi		2			1	21	5
West South Central		**61**		**12**	**11**	**434**	**35**
Arkansas		3		6		48	
Louisiana		8			4	3	
Oklahoma		5		1	1	30	4
Texas		45		5	6	353	31
Mountain	2	**71**			**2**	**125**	**2**
Montana		4				10	
Idaho		20			1	7	
Wyoming	2	1				3	
Colorado		11				19	1
New Mexico		1			1	20	
Arizona		9				56	1
Utah		[2] 25				10	
Nevada							
Pacific		**272**			**5**	**111**	**3**
Washington		26				25	1
Oregon		15				13	
California		[2] 231			5	73	2
Alaska		4				2	
Hawaii		3					

[1] Including cases reported as salmonellosis. [2] Including cases reported as streptococcal sore throat.

FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended May 5, 1951

Disease	Total	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	4					1		2			1
Chickenpox	976	1		48		129	509	27	26	51	185
Diphtheria	3				1	2					
Dysentery, bacillary	10						4	1			5
Encephalitis, infectious	1								1		
German measles	444			20		37	236		30	46	75
Influenza	61			27	5		1	17			11
Measles	1,679	4		66	3	186	876	265	7	168	104
Meningitis, meningococcal	3						2				1
Mumps	768	1		22	1	167	284	53	88	77	75
Poliomyelitis	3						1	1		1	
Scarlet fever	252	1			1	59	47	30	16	30	68
Tuberculosis (all forms)	205	19		9	1	67	15	16	1	15	62
Typhoid and paratyphoid fever	7	1				3	2				1
Venereal diseases:											
Gonorrhea	271	4		3	13	89	47	15	21	29	50
Syphilis	105	5		10	3	55	16		8	1	7
Primary	7				1	1	2		2		1
Secondary	7	1		1		4	1				
Other	91	4		9	2	50	13		6	1	6
Whooping cough	135			3	1	16	52	15	1	13	34

FINLAND

Reported Cases of Certain Diseases—March 1951

Disease	Cases	Disease	Cases
Diphtheria	44	Scarlet fever	2,113
Dysentery	1	Typhoid fever	7
Meningitis, meningococcal	10	Venereal diseases:	
Paratyphoid fever	30	Gonorrhea	411
Poliomyelitis	7	Syphilis	25

NORWAY

Reported Cases of Certain Diseases—February 1951

Disease	Cases	Disease	Cases
Diphtheria	9	Pneumonia (all forms)	3,296
Encephalitis, infectious	1	Poliomyelitis	14
Erysipelas	280	Rheumatic fever	95
Gastroenteritis	2,128	Scabies	757
Hepatitis, infectious	50	Scarlet fever	111
Impetigo contagiosa	1,367	Tuberculosis (all forms)	295
Influenza	5,548	Venereal diseases:	
Malaria	2	Gonorrhea	157
Measles	3,175	Syphilis	45
Meningitis, meningococcal	6	Whooping cough	1,607
Mumps	101		

CUBA

Reported Cases of Certain Diseases, for 3 Periods

4 weeks ended Feb. 24, 1951

Disease	Total	Pinar del Rio	Habana		Matanzas	Santa Clara	Camaguey	Oriente
			Habana City	Total				
Brucellosis	1							1
Cancer	75	4		12	11	25	4	19
Chickenpox	86		21	21	11		4	50
Diphtheria	18		8	10	5	1		2
Hookworm	14			14				
Leprosy	1			1				
Malaria	24		1	2			1	21
Measles	34		11	20	1	2	1	10
Poliomyelitis	2							2
Tetanus	1							1
Tuberculosis	33			6	3	4	13	7
Typhoid fever	32	2	3	12	1	6	3	8
Whooping cough	48						48	

5 weeks ended Mar. 31, 1951

Disease	Total	Pinar del Rio	Habana		Matanzas	Santa Clara	Camaguey	Oriente
			Habana City	Total				
Cancer	99	5		17	19	22	5	31
Chickenpox	147		59	82	5	8	31	21
Diphtheria	27	3	11	18	2	1		3
Hookworm	13			13				
Leprosy	3			1			1	1
Malaria	12		1	1		1	1	9
Measles	51		33	34	3	11	2	1
Poliomyelitis	1							1
Tuberculosis	79	5		19	16	16	10	13
Typhoid fever	56	3	4	10	3	12	5	23
Whooping cough	16						6	10

4 weeks ended Apr. 28, 1951

Disease	Total	Pinar del Rio	Habana		Matanzas	Santa Clara	Camaguey	Oriente
			Habana City	Total				
Cancer	74	3		13	13	22	2	21
Chickenpox	140		46	51	3	25	47	14
Diphtheria	18	2	8	10	5			1
Leprosy	3			2				1
Malaria	4							4
Measles	123		30	37	2	30	25	29
Poliomyelitis	2						1	1
Tetanus	2				1			1
Tuberculosis	68	2	1	21	4	15	14	12
Typhoid fever	28	7	2	5		8	3	5
Whooping cough	19			3			15	1

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently. A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Smallpox

Ceylon. For the week ended May 19, 1951, 26 cases of smallpox were reported compared with 2 for the previous week.

Algeria. During the period April 21–30, 1951, four cases of smallpox were reported compared with two for the previous 10-day period.

Togo (French). During the period May 1–10, 1951, five cases of smallpox were reported. These are the first cases reported since March 31.

Venezuela. During March 1951, 16 cases of alastrim were reported in Venezuela.

Typhus Fever

Turkey. Five cases of typhus fever were reported in Turkey for the week ended May 19, 1951; two were in Istanbul and one in Trabzon.

India. Eight cases of typhus fever were reported in Bombay for the week ended May 12, 1951, compared with three for the previous week.

Yellow Fever

Gold Coast. During the period May 5–8, 1951, four suspected cases of yellow fever were reported in Suhum. The patients were admitted to the hospital in Accra.

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It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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